JEPP'S BRIEFING

The Chart Clinic – Twenty Ninth in a Series

By James E. Terpstra
Sr. Corporate Vice President, Jeppesen

If it were always VFR at mountainous airports, and if there were no other airplanes at the hub airports, you could depart an airport and do almost anything you wanted. Unfortunately, cumulogranite clouds surround many airports. Also, ATC gives us departure paths other than direct routes at busy airports. These published paths are generally designed to comply with ATC departure procedures and are now called Departure Procedures (DPs). They started their life with the name standard instrument departures (SIDs).

The development of DPs was an evolutionary process. Pilots and controllers wanted complicated verbal departure procedures committed to paper to simplify clearance delivery procedures. Initially, DPs were available in narrative form only back in the late 1960s, but they were made into graphics a short time later because of Jeppesen user comments.

If you depart an airport which has one or more published DPs, you can expect to be cleared via one of these procedures. However, to accept a DP in your clearance, you must possess at least the text description of the DP. If you don't want to follow a DP, include a note stating "no DPs" in the remarks section of the FAA flight plan. Adherence to all restrictions on the DP is required unless clearance to deviate is received from ATC.

Most Departure Procedures are divided into two main parts: the actual departure, followed by the transitions. The first portion begins at the airport and terminates at a fix such as a navaid, intersection, DME fix, or RNAV waypoint. The transitions start at the fix where the standard instrument departure terminates and the transition, by design criteria, is supposed to end at an enroute fix.

JEPPESEN 7 AUG 98 (10-3D) — SID
LAS VEGAS, NEV
McCARRAN INTL
LAS VEGAS Departure (R) 125.9

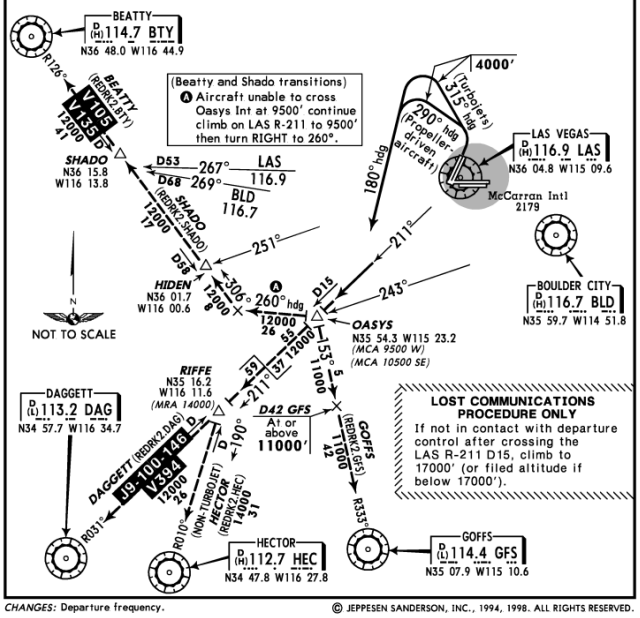
RED ROCK TWO DEPARTURE (REDRK2.OASYS) (PILOT NAV)
(RWYS 1L/R) (DME AND RADAR REQUIRED)
(HECTOR TRANSITION IS FOR NON-TURBOJET AIRCRAFT ONLY)
(DAGGETT TRANSITION IS FOR AIRCRAFT REQUESTING AT OR BELOW FL230 ONLY)

This SID requires a ceiling and visibility of 1200-3 and a climb gradient of 410'/NM to 5000'.

Gnd speed-Kts	75	100	150	200	250	300
410' per NM	513	683	1025	1367	1708	2050

Runways 1 L/R: CAUTION obstacle at 3189' MSL, at 2.93 NM NORTH. For obstacle clearance a minimum climb of 410'/NM to 3000' MSL is required.
TAKE-OFF RWYS 1L/R
Turbojets: Climbing LEFT turn to a 315° heading to 4000', then climbing LEFT turn to a 180° heading to intercept the LAS R-211. Thence
Propeller-driven aircraft: Climbing LEFT turn to a 290° heading to 4000', then climbing LEFT turn to a 180° heading to intercept the LAS R-211. Thence
DEPARTURE
Climb via the LAS R-211 to Oasys Int, then via (transition) or (assigned route).

MAINTAIN 9000' or assigned lower altitude. Expect 17,000' (or filed altitude if below 17,000') 15 NM from LAS VOR, and clearance to filed altitude 10 minutes after departure.
TRANSITIONS
Beatty (REDRK2.BTY): From Oasys Int to BTY VOR: Via a 260° heading to intercept via BTY R-126.
MCA 9500' westbound at Oasys Int. (A)
Daggett (Aircraft requesting at or below FL230) (REDRK2.DAG): From Oasys Int to DAG VOR: Via LAS R-211 and DAG R-031.
Goffs (REDRK2.GFS): From Oasys Int to GFS VOR: Via GFS R-333.
MCA 10500' southeast bound at Oasys Int and MCA at GFS R-333 D42 at or above 11000'.
Hector (Non-Turbojet aircraft) (REDRK2.HEC): From Oasys Int to HEC VOR: Via LAS R-211, DAG R-031 to Riffe Int, then via HEC R-010. MRA 14000' at Riffe Int.
Shado (REDRK2.SHADO): From Oasys Int to Shado Int: Via a 260° heading to intercept BTY R-126.
MCA 9500' westbound at Oasys Int. (A)



CHANGES: Departure frequency.

Refer to the "Red Rock Two Departure" from Las Vegas, Nevada, which is a typical Departure Procedure. *This DP is still titled "SID" and will be changed to DP when it is revised for other aeronautical reasons.* Most of the symbols used on the DP charts are the same as those used on the enroute navigation charts (with some exceptions). The navigation frequency box is the same as used on the high altitude charts. These facility boxes include the latitude/longitude coordinates for aircraft equipped with latitude/longitude systems, but no airborne database. The same symbols also are used on both types of charts for: MEA designations, leg segment distances, DME fix identifiers, changeover point symbols, and magnetic radial designations.

One major difference found on the DP charts, when compared to other Jepp charts, is that the DPs are *not drawn to scale.* Although the layout of the fixes on the chart are drawn schematically, the mileages cannot be determined accurately by the use of a plotter. DPs that are drawn to scale would be desirable, but with so much detail next to the airport as well as transitions which are often hundreds of miles long, a chart that was drawn to scale would force the initial departure information to be too small to read.

The main body of the DP is depicted with a heavy, solid line, and the DP transitions are designated with heavy, dashed lines for distinction.

Departure Procedure Names

Each DP is named according to the last fix on the main portion of the DP. At Las Vegas, the DP ends at the Oasys intersection, but since there already is an Oasys DP, another name had to be selected. The title "Red Rock" was arbitrarily chosen since there are no rules for alternate names. The number designator in the DP title represents the revision number of the particular DP. This is particularly useful in communications with ATC. For example, when this departure procedure is revised, it will be titled "Red Rock Three Departure." When the controller assigns you the Red Rock Three Departure, and your DP chart still reads "Red Rock Two Departure," you know immediately that you didn't file last week's revision.

The computer code in parentheses to the right of the departure name is *not* used in communications; however, this code can be helpful in many cases. When filing an IFR flight plan from Las Vegas which includes this DP, you should give the computer code in the flight plan. The computer code in parentheses is only for the segment from the airport to the end of the DP, but not to the end of the transition you might want to fly. If your request includes both a DP and a transition, the DP and the transition code both should be used. This will expedite the processing of your IFR flight plan through the flight service station and the air route traffic control center.

To the right of the computer code are the words "Pilot Nav" in parentheses. There are also DPs with the word "Vector" in parentheses. Both of these sets of words are meant to indicate the primary means of navigation on the particular DP. However, the distinction between the two is sometimes a little blurry, so the terms will be dropped in the future.

Flying the DP

As a practical application, let's fly the Red Rock Two Departure and Goffs Transition from a takeoff on Runway 1L. The IFR clearance given to you by Las Vegas Clearance Delivery would be something like this: "Saberliner 737R, cleared to Douglas Airport as filed, Red Rock Two departure, Goffs Transition, maintain..."

Now check the narrative description of the DP. The notation in parentheses under the title indicates this departure is only for Runways 1 Left and Right and that DME and radar are required for this DP. You will also notice there are restrictions on the Hector and Daggett Transitions. The first portion of the DP text states that this procedure requires a *ceiling* of 1,200 feet and a *visibility* of 3 miles, plus a minimum climb rate of 410 feet per nautical mile to 5,000 feet. These minimum climb

rates are stated in the DP text only when they exceed a rate of 152 feet per nautical mile. Below the climb gradient statement, there is a table that gives the climb rate in feet per minute at various ground speeds so that you have some numbers that are meaningful when reading the panel instruments.

The information in the takeoff paragraph states that departures for turbojets should be a climbing left turn to a 315° heading to 4,000 feet, then a climbing left turn to a 180° heading to intercept the Las Vegas 211° radial. *Then* the word "Thence" which starts the departure path that states a climb via the Las Vegas 211° radial to the Oasys intersection followed by the transition or other route from Oasys. It's not stated in each DP, but the initial turn after lift off should be *after reaching 400 feet above the airport* since that is standard for all departures.

On this departure, there is a Lost Communications procedure that is enclosed in a box comprised of hashed lines that state what to do if not in contact with departure control. The Lost Communications procedure is available only on a few departure procedures. When the Lost Communications are not available in text form on the procedure, then the standard FAR Part 91 lost communications procedures apply.

DP Transition

The information included in the transitions paragraph includes the departure procedures for either normal procedures or for a communications failure. For this hypothetical flight, the course after Oasys goes to the Goffs VORTAC. Since we are flying the Goffs Transition, the computer code (REDRK2.GFS) should be used when filing the flight plan to help expedite it through the flight service station and air route traffic control center. The transition identifier is shown adjacent to the transition track.

The Goffs Transition departs Oasys intersection via the Goffs 333 radial. Note the number 153 in large type right after Oasys. This shows the course setting to use when departing Oasys, so you don't have to mathematically derive the reciprocal of the 333 radial from the Goffs VOR. The Goffs Transition narrative is duplicated in the graphic depiction of the transition, so you will eventually see the text description of the transitions disappear from the DP pages. This should make it much easier to read, since much of the textual "clutter" will disappear.

At Oasys, note that there are two MCAs (minimum crossing altitudes). MCAs are specified for obstacle clearance, whereas the 11,000-foot altitude restriction at the 42 DME fix from Goffs is an ATC restriction (even though the MEA on the transition is also 11,000 feet). The MCA of 10,500 feet at Oasys is applicable for flights to the southeast which is the direction of the Goffs Transition.

On the Daggett Transition, there are a couple of unusual pieces of information. On the transition, there is a changeover point (COP) which is 37 miles from Las Vegas and 59 miles to the Daggett VOR. Also, there is an MRA (minimum reception altitude) at the Riffe intersection which is 14,000 feet. Most likely, the MRA is to receive the Hector VOR since you are already high enough at the MEA of 12,000 feet to receive the Daggett VOR. So, if you are using the DME from Daggett, you can ignore the MRA at Riffe.

In the next article, we will conclude the series with a discussion on STARs.

James E. Terpstra is senior corporate vice president, aviation affairs at Jeppesen. His ratings include ATP, single and multi-engine, airplane and instrument flight instructor. His 6,000+ hours include 3,200 instructing.
For comments, please Email: JimTerps@jeppesen.com